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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicants : Dieter SCHULER et al.
Serial No. : 09/446,390
Filed : December 21, 1999
For : ELECTRIC MACHINE HAVING A COMMUTATOR
Examiner : Dang Dinh LE
Art Unit : 2834
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APPELLANTS' APPEAL BRIEF
UNDER 37 C.F.R. § 1.192

S I R :

Applicants filed a Notice of Appeal (dated February 22, 2002, and filed in the PTO on March 8, 2002) from the Final Office Action dated October 25, 2001, finally rejecting claims 6 and 10-24 of the above-identified application. This Brief is submitted by Applicants in support of their appeal.

I. REAL PARTY IN INTEREST

The above-identified Applicants and Robert Bosch GmbH of Stuttgart, Germany, are the real parties in interest.

II. RELATED APPEALS AND INTERFERENCES

No appeal or interference which will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal is known to the undersigned attorney or is believed by the undersigned attorney to be known to Applicants.

III. STATUS OF CLAIMS

Claims 6 and 10-24 are pending in this application. Applicants appealed from the final rejection of claims 6 and 10-24 made in the final Office Action mailed by the Patent Office on October 25, 2001. Of the claims presently on appeal, claims 6, 10, 15 and 20 are independent. Claims 16-19 and 22 ultimately depend from claim 6; claims 11-14 and 23 ultimately depend from claim 10; claim 24 depends from claim 15; claim 21 depends from claim 20. The claims on appeal are set forth in the Appendix submitted herewith.

IV. STATUS OF AMENDMENTS

Subsequent to the final Office Action dated October 25, 2001, Applicants filed an Amendment dated January 9, 2002, amending claims 15 and 20. In the Advisory Action dated January 24, 2002, the Examiner indicated that the amendments to claims 15 and 20 will be entered for the purposes of this Appeal.

V. SUMMARY OF THE INVENTION

The present invention relates to an electric machine having a commutator, at least one brush and a supply of oil lubricant for providing lubrication between the commutator and the at least one brush. According to the present invention, the lubricant, e.g., an oil, is applied to the brushes (19, 20) only in the area of collector-side end faces (29, 30) before installing the brushes (19, 20) in the electric machine (2). (Fig. 2; Abstract). The lubricant may be applied by spraying or by some other method, and application of lubricant here is limited to the end faces (29, 30) of the brushes (19, 20) or to short partial lengths (19a, 20a) thereof adjacent to the end faces. (Fig. 2; Abstract). By limiting the supply of lubricant in this way, the lubricant is used up during run-in of the electric machine

(2) or not too long thereafter, with the advantage that it counteracts the risk of brush abrasion fines or collector abrasion fines collecting in grooves (28) between collector bars (27), the less abrasion fines deposited in the grooves (28), the lower the risk of parasitic currents developing between the bars (27). (Fig. 2; Abstract).

As shown in Figure 1, for example, an electric machine 2 has an armature 7 that can rotate between permanent magnets 5 and 6 and a collector 8 allocated to armature 7, and a friction bearing 10 next to collector 8. (Fig. 1; p. 4, l. 16-25). Friction bearing 10 includes a friction bearing bush 12, which is impregnated with an oil lubricant. (Fig. 1; p. 4, l. 25-31). In this example, two brushes 19, 20 made either partially of carbon or mainly of a pressed metal powder or alloys according to the related art are provided for collector 8. (Fig. 1; p. 5, l. 8-10). In addition, a dust guard 25 may be provided on shaft 9 between collector 8 and friction bearing bush 12. (Fig. 1; p. 5, l. 16-17).

Figure 2 shows end faces 29, 30 of brushes 19, 20, with these end faces 29 and 30 being directed against collector 8 for electrically conducting contact with bars 27 of this collector 8. (Fig. 2; p. 5, l. 31 - p. 6, l. 1). In the example shown here, each of two brushes 19, 20 is prepared with an oil lubricant, for example, along a partial length 19a and 20a marked graphically starting from these end faces 29 and 30. (Fig. 2; p. 6, l. 1-4). This oil lubricant may be sprayed or otherwise applied with or without diluting before installing brushes 19, 20 in electric machine 2. (Fig. 2; p. 6, l. 4-8). It may be sufficient if one of two brushes 19 or 20 is provided with a supply of oil lubricant because all collector bars 27 come in contact with the lubricant, starting from this prepared brush. (Fig. 2; p. 6, l. 15-18). If both brushes 19 and 20 are each installed and provided with a supply of lubricant, this yields the advantage that only one type of brush need be kept in stock. (Fig. 2; p. 6, l. 26-28).

Figure 3 shows another illustration of brush 20, which is rotated 90° in comparison with Figure 2. (Fig. 3; p. 6, l. 25-26). This makes grooves 31, which are aligned in the circumferential direction of collector 8, visible. (P. 6, l. 26-28).

These grooves 31 permit a rapid adaptation of the curvature of end faces 29 and 30 of brushes 19 and 20 to the external shape of bars 27, with the goal of rapidly creating a contact surface corresponding to the respective dimensions of brushes 19, 20 in the circumferential direction of collector 8. (Fig. 3; p. 6, l. 29 - p. 7, l. 1). When such grooves 31 are cut into brushes 19, 20 before applying oil lubricant, they are also useful as storage containers for the oil lubricant. (Fig. 3; p. 7, l. 1-4).

VI. ISSUES FOR REVIEW

The following issues are presented for review on appeal in this case:

A) Whether the subject matter of claims 15, 20, 21 and 24 is anticipated under 35 U.S.C. § 102(b) by U.S. Patent No. 2,172,045 ("the Burr patent").

B) Whether the subject matter of claims 6, 10, 11, 14, 16, 19, 22 and 23 is rendered obvious under 35 U.S.C. § 103(a) by U.S. Patent No. 2,172,045 ("the Burr patent") in view of U.S. Patent No. 2,555,997 ("the Portail patent").

C) Whether the subject matter of claims 12 and 17 is rendered obvious under 35 U.S.C. § 103(a) by U.S. Patent No. 2,172,045 ("the Burr patent") in view of U.S. Patent No. 2,555,997 ("the Portail patent") and further in view of U.S. Patent No. 3,841,906 ("the Grunewald et al." patent).

D) Whether the subject matter of claims 13 and 18 is rendered obvious under 35 U.S.C. § 103(a) by U.S. Patent No. 2,172,045 ("the Burr patent") in view of U.S. Patent No. 2,555,997 ("the Portail patent") and further in view of U.S. Patent No. 4,820,948 ("the Rogelein et al." patent).

VII. GROUPING OF CLAIMS

For purposes of this appeal, claims do not stand or fall together. Claims 15, 20, 21 and 24 will be argued as one group. In addition to arguments which apply to claims 6 and 10 and their dependent claims 11-14, 16-19 and 22-23, additional arguments will be presented for specifically for each of the dependent claims 12, 13, 17 and 18. Accordingly, claims 6, 10, 11, 14, 16, 19, 22 and 23 will be argued as another group; claim 12 and 17 will be argued as yet another group; and claims 13 and 18 will be argued as still another group.

VIII. ARGUMENT

A. Rejection of Claims 15, 20, 21 and 24

The Examiner has rejected claims 15, 20, 21 and 24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 2,172,045 to ("Burr et al.") It is respectfully submitted that the Burr patent does not anticipate the subject matter of any of claims 15, 20, 21 and 24.

Independent claim 15 recites "an end face of the brush with a plurality of channels; and a supply of lubricant in an area of the end face of the brush . . . , wherein the plurality of channels along the collector end face are open at each end along the collector end face." Independent claim 20 recites "at least one brush, wherein a collector-side end face of the at least one brush has a plurality of channels; and a supply of lubricant . . . , wherein the at least one brush contains the lubricant at a location which is at least one of: (a) in or on the collector-side end face of the at least one brush, and (b) in or on a partial length of the at least one brush beginning at the collector-side end face of the at least one brush, wherein the channels are open at each end along the collector-side end face."

To reject a claim under 35 U.S.C. § 102(b), the Office must demonstrate that each and every claim limitation is identically disclosed in a single prior art reference. (*See Scripps Clinic & Research Foundation v. Genentech, Inc.*, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991)). "The identical invention must be shown in as complete detail as is contained in the claim." M.P.E.P. § 2131. Applicants respectfully submit that Burr does not disclose each and every element of the claimed invention.

Burr is directed to a brush 1 having narrow recesses or slots 2 filled with insert or filler 3. However, there is no disclosure in Burr that the plurality of channels (31) along the collector end face (30) are open at each end along the collector end face (30), as recited in Claims 15 and 20 of the present application. In fact, Burr teaches away from Applicants' invention when in column 1, lines 30-33, he states that filler material is "**permanently secured** in a recess formed in the brush body" and that "it is preferred to locate the strips close to opposite edges of the working face of the brush, since this arrangement of the lubricating strips tends to provide a smoother riding brush." (See column 4, lines 2-6). Burr clearly

indicates that slots or recesses 2 are filled with a plastic heat-hardenable composition 3, which is baked to solid state and integrally united to the body of the brush 1.

The Examiner responds by contending that the “claims are open ended claims and they do not exclude the fact that the open channels are not filled with soft lubricant or filler.” (1/24/02 Advisory Action, paragraph 5). First, the Examiner’s contention is misplaced because Burr clearly indicates that the composition 3 is **baked to a solid state** for its intended use of filling the recesses 2. Second, once the composition 3 is baked to solid state and integrally united to the body of the brush 1 as intended, the recess 2 is completely filled with a solid material, and it is impossible for the solid-filled recess 2 of Burr to be equivalent to “the plurality of channels along the collector end face [which] are open at each end along the collector end face.”

Furthermore, to the extent the Examiner relies on Figure 2 of Burr, the slots or recesses 2 in Figure 2 of the Burr patent are shown as being open, since Figure 2 shows an **intermediate stage** of the brush 1 prior to the filling of the slots 2 with plastic composition or filler 3 (cf. page 1 of the description, column 1, lines 48 to 50). Therefore, if the slots 2 are open, then this would also mean that the brush 1 according to Figure 2 does not contain any lubricant at all, which in turn means that all the features regarding the lubricant recited in Claims 15 and 20 could not have been anticipated by Burr.

However, Burr clearly indicates the intent to provide slots or recesses 2 that are filled with a plastic heat-hardenable composition 3. The brush body 1 is baked to solidify the insert 3 and provide one or more lubricating strips 3 extending to the bearing face. The one or more lubricating strips 3 are integrally united to the body of the brush 1 (cf. page 1 of the description, column 2, lines 6 to 11). Since these slots or recesses 2 are completely filled with the plastic material 3, they cannot be interpreted as grooves that are open at each end along the collector-side end face according to Claims 15 and 20. Therefore, Claims 15 and 20 are novel and not anticipated by Burr.

Since Burr pursues a completely different way of lubrication (baked plastic), it would not have been obvious for one skilled in the art to modify his invention in an attempt to approximate the subject matter of claims 15 and 20.

Claims 21 and 24 depend from, and include all the limitations of, Claims 20 and 15, respectively, and therefore Claims 21 and 24 are likewise not anticipated by Burr. Furthermore, Burr does not teach the limitation that "the collector (8) has a plurality of grooves (28)," as recited in claims 21 and 24.

For at least the reasons discussed above, withdrawal of the rejection under 35 U.S.C. §102 (b) of Claims 15, 20, 21 and 24 is hereby respectfully requested.

B. Rejection of Claims 6, 10, 11 14, 16, 19, 22 and 23

Claims 6, 10, 11, 14, 16, 19, 22 and 23 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Burr (U.S. Patent No. 2,172,045) in view of Portail (U.S. Patent No. 2,555,997). Applicants respectfully submit that this rejection should be withdrawn for at least the following reasons.

In order for a claim to be rejected for obviousness under 35 U.S.C. § 103(a), not only must the prior art teach or suggest each element of the claim, the prior art must also suggest combining the elements in the manner contemplated by the claim. See Northern Telecom, Inc. v. Datapoint Corp., 908 F. 2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F. 2d 831, 834 (Fed. Cir. 1990). The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. See M.P.E.P. §2142. To establish a *prima facie* case of obviousness, the Examiner must show, *inter alia*, that there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references and that, when so modified or combined, the prior art teaches or suggests all of the claim limitations. See M.P.E.P. §2143. Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness.

Burr is directed to a brush 1 having narrow recesses or slots 2 filled with a **solid insert or filler** 3. Portail discloses a sliding contact of electric machines where a thin layer of a lubricant is spread over a commutator 1 via a brush 2. However, the combination of Burr and Portail clearly fail to teach or suggest all the limitations of the present claimed invention of independent claims 6 and 10. The combination of Burr and Portail fail to teach that the plurality of grooves (31) along the collector end face (30) are open at each end along the collector end face (30), as recited in Applicants' independent Claims 6 and 10. Burr actually teaches away from Applicants' claimed invention: Burr states in column 1, lines 30-33, that the solid filler material is "**permanently secured in a recess** formed in the brush body," and in column 4, lines 2-6, that "it is preferred to locate **the strips** close to opposite edges of the working face of the brush, since this arrangement of the lubricating strips tends to provide a smoother riding brush."

Additionally, the asserted combination of Portail and Burr is unwarranted for the following reason: the proposed modification would render both the invention of Burr as well as the invention of Portail unsatisfactory for their intended purposes, which indicates that there is no motivation to make the asserted combination of Portail and Burr. Applicants note that Burr teaches the use of a filler material that is "permanently secured in a recess formed in the brush body, (see column 1, lines 30-33), while Portail teaches the use of brushes through which thin film (11) that can be fed through (see column 4, lines 13-15). It is clear that a thin film (11) of Portail cannot be permanently secured to the recesses (2) of Burr, and the permanently securable filler material (3) of Burr cannot be fed through the brush (2) of Portail. Accordingly, the proposed modification would render both the invention of Burr as well as the invention of Portail unsatisfactory for their intended purposes. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984). Since the proposed modification would render both the invention of Burr as well as the invention of Portail unsatisfactory for their intended purposes, there is clearly no motivation to make the asserted combination.

For the foregoing reasons, independent Claims 6 and 10 are allowable over the combination of Burr and Portail. Claims 11, 14, 16, 19, 22 and 23 depend from, and include all the limitations of, Claim 10 or Claim 6, so Claims 11, 14, 16, 19, 22 and 23 are similarly allowable over the combination of Burr and Portail.

For at least the reasons discussed above, withdrawal of the rejection under 35 U.S.C. §103(a) of Claims 6, 10, 11 14, 16, 19, 22 and 23 is hereby respectfully requested.

C. Rejection of Claims 12 and 17

Claims 12 and 17 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Burr (U.S. Patent No. 2,172,045) in view of Portail (U.S. Patent No. 2,555,997) and further in view of Grunewald et al. (U.S. Patent No. 3,841,906). Applicants respectfully submit that this rejection should be withdrawn for at least the following reasons.

Applicants note that claims 12 and 17 depend from previously-discussed claims 10 and 6, respectively. Furthermore, Applicants note that Grunewald fails to disclose a brush wherein the brush has a plurality of grooves along the collector-side end face and wherein the grooves are open at each end along the collector-side end face, as recited in claims 6 and 10. Accordingly, since Grunewald does not overcome the deficiencies of Burr and Portail as applied against claims 10 and 6, the combination of Burr, Portail and Grunewald fails to render obvious the subject matter of dependent claims 12 and 17.

For at least the reasons discussed above, withdrawal of the rejection under 35 U.S.C. §103(a) of Claims 12 and 17 is hereby respectfully requested.

D. Rejection of Claims 13 and 18

Claims 13 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Burr (U.S. Patent No. 2,172,045) in view of Portail (U.S. Patent No. 2,555,997) and further in view of Rogelein et al. (U.S. Patent No. 4,820,948).

Applicants respectfully submit that this rejection should be withdrawn for at least the following reasons.

Applicants note that claims 13 and 18 depend from previously-discussed claims 10 and 6, respectively. Furthermore, Applicants note that Rogelein fails to disclose a brush wherein the brush has a plurality of grooves along the collector-side end face and wherein the grooves are open at each end along the collector-side end face, as recited in claims 6 and 10. Accordingly, since Rogelein does not overcome the deficiencies of Burr and Portail as applied against claims 10 and 6, the combination of Burr, Portail and Rogelein fails to render obvious the subject matter of dependent claims 13 and 18.

Independent of the above, Applicants note that Rogelein fails to disclose a dust guard for protecting the brush, as recited in claims 13 and 18. Rogelein merely discloses an electric motor 1 having a rubber collar 29 to trap oil 34. For this additional reason, Claims 13 and 18 are not rendered obvious by the combination of Burr, Portail and Rogelein.

For at least the reasons discussed above, withdrawal of the rejection under 35 U.S.C. §103 (a) of Claims 13 and 18 is hereby respectfully requested.

IX. CONCLUSION

For the foregoing reasons, it is respectfully submitted that the final rejection of claims 6 and 10-24 should be reversed.

Respectfully submitted,

KENYON & KENYON

Dated: 5/8, 2002

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Signature: [Signature]
Jong H. Lee

**APPENDIX TO APPELLANTS' APPEAL BRIEF
UNDER 37 C.F.R. § 1.192**

S I R :

The claims involved in this appeal, claims 6 and 10-24, in their
current form after entry of all amendments presented during the course of
prosecution, are set forth below:

APPEALED CLAIMS:

6. An electric machine comprising:
- a commutator;
 - at least one brush; and
 - a supply of oil lubricant for providing lubrication between the
commutator and the at least one brush,

wherein the at least one brush contains the lubricant at least one of:
(a) in or on a collector-side end face of the at least one brush, and (b) in or on a partial length of the at least one brush beginning at the collector-side end face of the at least one brush, wherein the brush has a plurality of grooves along the collector-side end face and wherein the grooves are open at each end along the collector-side end face.

10. A brush for an electric machine equipped with a collector, comprising:
an end face; and
a supply of oil lubricant in an area of the end face allocated to the collector, wherein the brush has a plurality of grooves along the collector end face and wherein the grooves are open at each end along the collector end face.
11. The brush according to claim 10, wherein the collector has recesses which function as storage reservoirs for the oil lubricant.
12. The brush according to claim 10, wherein the brush is made from carbon, pressed metal powder or alloys thereof.
13. The brush according to claim 10, wherein the brush is protected by a dust guard.
14. The brush according to claim 10, wherein the end face has a plurality of channels.
15. A brush for an electric machine equipped with a collector, comprising:
an end face of the brush with a plurality of channels; and
a supply of lubricant in an area of the end face of the brush allocated to the collector, wherein the plurality of channels along the collector end face are open at each end along the collector end face.

16. The brush according to claim 6, wherein the commutator has recesses which function as storage reservoirs for the oil lubricant.
17. The brush according to claim 6, wherein the brush is made from carbon, pressed metal powder or alloys thereof.
18. The brush according to claim 6, wherein the brush is protected by a dust guard.
19. The brush according to claim 6, wherein the collector-side end face has a plurality of channels.
20. An electric machine comprising:
a commutator;
at least one brush, wherein a collector-side end face of the at least one brush has a plurality of channels; and
a supply of lubricant for providing lubrication between the commutator and the at least one brush,
wherein the at least one brush contains the lubricant at a location which is at least one of: (a) in or on the collector-side end face of the at least one brush, and (b) in or on a partial length of the at least one brush beginning at the collector-side end face of the at least one brush, wherein the channels are open at each end along the collector-side end face.
21. The electric machine according to Claim 20 wherein the collector has a plurality of grooves.
22. The electric machine according to Claim 6 wherein the collector has a plurality of grooves.

23. The brush according to Claim 10 wherein the collector has a plurality of grooves.

24. The brush according to Claim 15, wherein the collector has a plurality of grooves.

Respectfully submitted,

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